NRCS
Natural Resources Conservation Service
Wyoming

RIPARIAN FOREST BUFFER - 391

Conservation Practice Specifications/Job Sheet

WY-ECS-79

JANUARY 2007

Definition

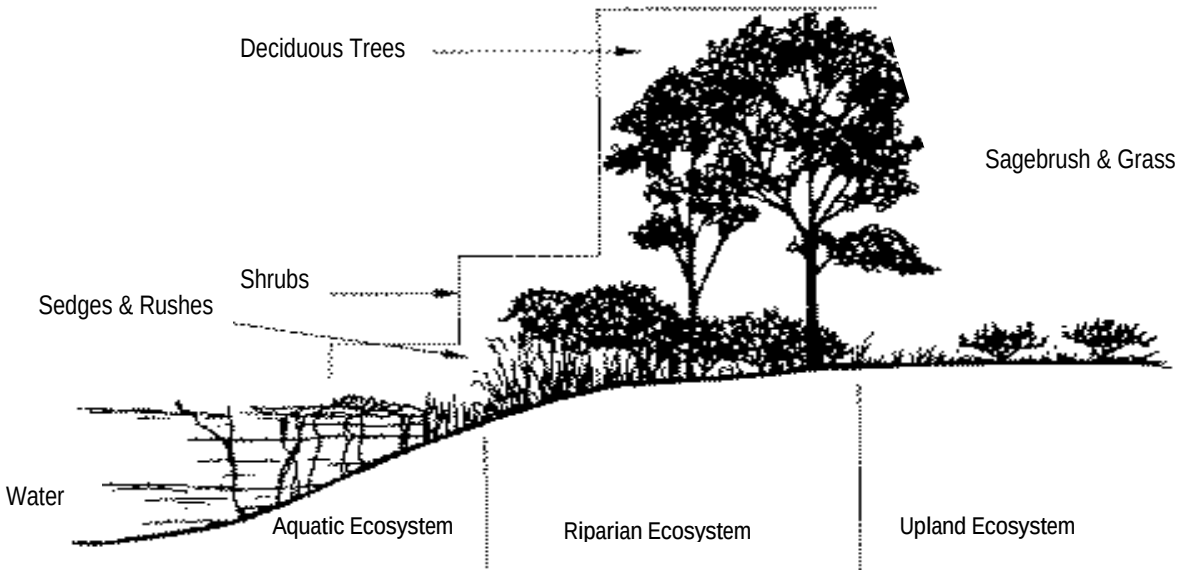
An area predominantly trees and/or shrubs located adjacent to and up-gradient from watercourses or water bodies.

Purpose

Riparian forest buffers create shade to lower or maintain water temperatures to improve habitat for aquatic organisms; create or improve riparian habitat and provide a source of detritus and large woody debris; and reduce excess amounts of sediment, organic material, nutrients, and pesticides in surface runoff and reduce excess nutrients and other chemicals in shallow ground water flow. Riparian forest buffers also reduce pesticide drift entering the water body; restore riparian plant communities; and increase carbon storage in plant biomass and soils.

Where used

Riparian forest buffers are applied on areas adjacent to permanent or intermittent streams, lakes, ponds, and wetlands. They are not applied to stabilize stream banks or shorelines.



A riparian forest buffer may include one or more planting zones, including the area closest to the stream or waterbody, and additional zones in the area adjacent to and up gradient of the water course. Trees and shrubs provide important wildlife habitat, litter fall for aquatic organisms, large wood that can fall into the stream or waterbody, and shading to lower water temperature. This helps stabilize streambanks and shorelines. Trees and shrubs up-gradient intercept sediment, nutrients, pesticides, and other pollutants in surface and subsurface water flows. Riparian areas can be managed to provide timber, wood fiber, and horticultural products. An upper planting zone is established if periodic and excessive water flows, erosion, and sediment from upslope fields or tracts are anticipated. This planting zone generally consists of herbaceous plants or grass and a diversion or terrace, if needed. This area provides a "first line of defense" to assure proper functioning of the buffer.

Resource management system

Riparian forest buffers are normally established concurrently with other practices as part of a resource management system for a conservation management unit. For example, adjoining streambanks or shorelines must be stabilized before or in conjunction with the establishment of the buffer (streambank and shoreline protection). To maintain proper functioning of a planting, excessive water flows and erosion must be controlled upslope of the riparian forest buffer (filter strip, diversion, critical area planting, residue management). New plantings must be protected from grazing during establishment (prescribed grazing, use exclusion).

Wildlife

Connecting a riparian forest buffer with existing perennial vegetation, such as woodlots and woody draws or other woody habitat, benefits wildlife, including fish and other aquatic organisms. Select tree and shrub species and a planting pattern that benefit the wildlife species of interest and enhance local landscape aesthetics.

Operation and maintenance

The following actions shall be carried out to insure that this practice functions as intended throughout its expected life.

The riparian forest buffer will be inspected periodically and protected from adverse impacts such as excessive vehicular and pedestrian traffic, pest infestations, pesticides, livestock or wildlife damage and fire.

Replacement of dead trees or shrubs and control of undesirable vegetative competition will be continued until the buffer is, or will progress to, a fully functional condition.

As applicable, control of concentrated flow erosion and sediment deposition shall be controlled by an adjacent filter strip.

Any use of fertilizers, pesticides and other chemicals to assure buffer function shall not compromise the intended purpose.

Specifications

Site-specific requirements are listed on the following pages. Additional provisions are entered on the job sketch sheet. Specifications are prepared in accordance with the NRCS Field Office Technical Guide. See practice standard Riparian Forest Buffer, code 391.

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Purpose (check all that apply)	
☐ Create shade to lower or maintain water temperatures to improve habitat for aquatic organisms	☐ Reduce pesticide drift entering the water body
☐ Create or improve riparian habitat and provide a source of detritus and large woody debris	☐ Restore riparian plant communities
☐ Reduce excess sediment, organic material, nutrients, pesticides in surface runoff and excess nutrients/chemicals in shallow groundwater flow	☐ Increase carbon storage in plant biomass and soils

Layout

Water body/course type and name, other:

The buffer shall extend a minimum width to achieve the purpose(s). For the purpose of water quality, the width shall be a minimum of 35 feet. Measurement shall begin at and perpendicular to the bank-full elevation.

Minimum buffer zone widths (feet) – specify left and right of stream [facing upstream/ downstream (circle appropriate one)] for a two-side buffer; use left only for water bodies, such as lakes and ponds. Planting zones are determined by moisture regimes at the site. Planting zone 1, next to the bank, receives the most consistent amount of soil moisture and periodic overflow, planting zone 2 is up-gradient but still receives soil moisture that can influence the choice of vegetation species, and planting zone3 is further up-gradient and can extend into the upland. On some sites, there may be only one or two planting zones.

Planting Zone 1 (next to bank)	**Planting Zone 2**	**Planting Zone3**
Left: Right:	Left Right:	Left: Right:
Notes:	Notes:	

The buffer zone length runs parallel with the bank and shall be sufficiently long to achieve identified purpose(s). Buffer zone length (ft):

Additional location and layout requirements:

Woody Plant Materials

Dominant vegetation will consist of existing, naturally regenerated, or seeded/planted trees and shrubs suited to the soil and hydrology of the site and the intended purpose(s).

Use tree and shrub species that are native and non-invasive. Substitution with improved and locally accepted cultivars or purpose-specific species is allowed. For plantings and seeding, only viable, high-quality and adapted plant materials will be used.

Species/cultivars:	Plants/ acre:	Type of stock[1]:	Avg. Spacing[2]:	Total number of plants
Planting Zone # 1 (next to bank)				
1				
2				
3				
4				
Planting Zone # 2				
1				
2				
3				
4				
Planting Zone # 3				
1				
2				
3				
4				

[1]BAreroot, COntainer, CUtting, Seed; include size, caliper, height, and age as applicable. [2]Spacing between plants to achieve plants/acre.

Planting Zones

TYPICAL RIPARIAN AREA CROSS-SECTION

Dry Sites Wet													Dry Sites Wet
Moist													Moist

Identify planting zone widths, including left & right side of Channel looking upstream

Channel

Temporary Storage Instructions

If planting of stock is delayed, dormant stock may be stored temporarily in a cooler or protected area. For stock that is expected to begin growth before planting, dig a V-shaped trench (heeling-in-bed) sufficiently deep and bury seedlings so that all roots are covered by soil. Pack the soil firmly and water thoroughly. Additional requirements:

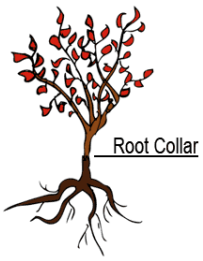
_____

Site Preparation

Site preparation shall be done at a time and manner to create planting spots and reduce competition to newly planted trees and/or shrubs -- see Tree/Shrub Site Preparation - 490. Disturbance of the site, particularly planting zone 1 along water courses, will be minimized between planted trees and/or shrubs to protect the areas from erosion. Additional requirements:

_____

Planting Methods



For container and bareroot stock, plant stock to a depth level with the root collar in holes deep and wide enough to fully extend the roots. Pack the soil firmly around each plant. Cuttings are inserted in moist soil with at least 2 to 3 buds showing above ground. Planting must be accomplished during a period of adequate moisture (neither too wet nor too dry) provided by natural or supplemental means. Plant only when air temperatures are above freezing and the soil is not frozen. Do not plant on hot, windy days to avoid excessive drying. The seedling roots must not be exposed to the air for more than 30 seconds. Roots of bareroot stock shall be kept moist during planting operations by placing in water-soil (mud) slurry, peat moss, super-absorbent (e.g., polyacrylamide) slurry or other equivalent material. Rooting medium of container or potted stock shall be kept moist at all times by periodic watering. Specify general dates (normal year): _____

Operation and Maintenance

The riparian forest buffer will be inspected periodically and protected from adverse impacts such as excessive vehicular and pedestrian traffic, pest infestations, concentrated flows, pesticides, livestock or wildlife damage and fire. Replacement of dead trees or shrubs and control of undesirable vegetative competition will be continued until the buffer is, or will progress to, a fully functional condition.

Any manipulation of species composition, stand structure and stocking by cutting or killing selected trees and understory vegetation shall sustain the intended purpose(s). Periodic removal of some forest products such as high value trees, medicinal herbs, nuts, and fruits is permitted provided the intended purpose is not compromised by the loss of vegetation or harvesting disturbance. Refer to the standard Forest Stand Improvement, 666.

The trees or shrubs will be protected damage from livestock and, as practicable, harmful wildlife, e.g., bud caps, specialized fencing, tree tubes, and wind protectors. Refer to the standards Prescribed Grazing, 528, and/or Use Exclusion, 472, as applicable. Fertilizers, pesticides and other chemicals used to maintain buffer function shall not impact water quality. Additional requirements:

Layout Sketch and Drawing (optional)

(Provide sketch and/or drawings as necessary or refer to conservation plan or other map.)

Scale 1"=_____ ft. (NA indicates sketch not to scale: grid size=1/2" by 1/2")

Additional Clarifying Notes (technical, programmatic, etc.):

Practice Specifications Approval and Completion Certification

DESIGN AND INSTALLATION/LAYOUT APPROVAL:

I have job approval authority and certify this practice has been designed with specifications to meet the conservation practice standard and that the client has been advised of installation and layout elements:

NRCS Representative name and title (type or print):		
NRCS Representative Signature:		Date:

LANDOWNER/OPERATOR ACKNOWLEDGES:

a. I have received a copy of these specifications and understand the contents including the scope and location of the practice.
b. I have obtained all necessary permits and/or rights in advance of practice application, and will comply with all ordinances and laws pertaining to the application of this practice.
c. No changes will be made in the installation of the job without prior concurrence of the NRCS.
d. Maintenance of the installed work is necessary for proper performance during the 15-year life of this practice.

I have reviewed all specifications and agree to install as specified:

Landowner/operator name and title (type or print):		
Landowner/operator Signature:		Date:

RECORD OF COMPLETION AND CHECK OUT CERTIFICATION:

Units (_____)	Date Completed by Client:	Date Certified:	Approver's Initials:

I have job approval authority and certify this practice has been applied and meets design specifications:

NRCS Representative name and title (type or print):		
NRCS Representative Signature:		Date:
Notes:		